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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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East Germany

Research on Rare Earths at the Institute for Inorganic Chemistry, Leipzig.

extraction with liquid ammonia of

The project undertaken by Mr. Zott called for the mixtures of neutral and basic nitrates, obtained from the partial thermic decomposition of mixtures of rare-earth-nitrates. It was expected that the neutral nitrates would dissolve much better in ammonia than the basic nitrates would. Results were good for the rare earths lying far apart on the atomic weight scale, but for rare earths in close proximity to each other the atomic weight differences were only 1-3 units. Other preliminary experiments Mr.Zott attempted to utilize the basically low differences in ionic migration velocities of the rare earths to separate them. The results are differences of atomic weight from 3.5 to 4.7 units. Comparisons are hardly possible with other methods because Mr.Zott worked with unknown mixtures.

The research group working with Mr. Zott consisted of Dr. Heinz Holzapfel, Dipl.Chem.Hans-Joachim Jahn, cand.chem. Joachim Massonne, and cand.chem Gerhard Zimmermann.

Since no up-to-date apparatus was available, such as a Roentgeno-spectrograph, Qu 24,[quarts spectrograph] or mirror monochromator, the necessary apparatus had to be constructed by adapting what was on hand or by building it from parts of discarded instruments.

The impurity of chemicals was another handicap. It was possible, although very time-consuming, to purify what chemicals were needed.

As far as literature is concerned: old "classic" handbooks were available for preliminary work. Soviet literature has been received more regularly for some time now, but as our study of the rare earths will progress, the need for foreign literature will increase.

The work plan is now divided into three parts: 1) as mentioned above, the building of the necessary apparatus. 2) Work to acquaint the group with the classic methods of rare-earth-chemistry. a) Determination of atomic weights. b) Development of a preparation "Crystals from liquor of Yttrium material". (The material used to start the experiments was found to be a potassium-rare-earth bisulfate.) 3) Work designed to increase the knowledge of the subject and to further develop methods in the field of rare earths. a) critical testing of the methods for the development of cerium preparations of greatest purity. b) Testing of Neunhoeffer's work on the detection by fluorescence of rare earths.

Dipl. Chemist Kurt Bernhardt worked on preliminary experiments on the dependence of pH of the precipitation of Yttrium with alizarin, the sodium salt of alizarin sulfonic acid .
Dipl. Chem Hermann Scholer experimented with separation experiments with lanthanum-Neodymium and Lanthanum-samarium mixtures.

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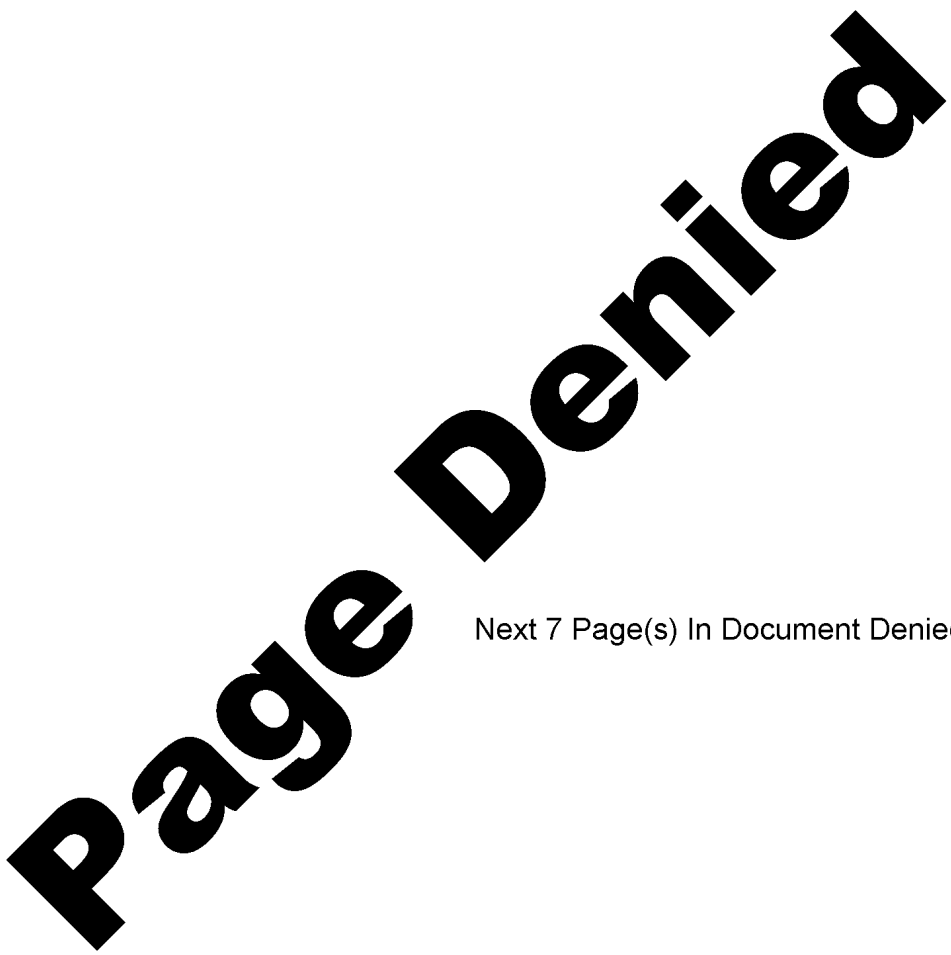

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